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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/811,306	KUBO, MASUMI	
	Examiner	Art Unit	
	JENNIFER ZUBAJLO	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 February 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 10 - 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiroshi Okumura (Pub. No.: US 2002/0191128) in view of Applicant's Admitted Prior Art.

As to claim 1, Okumura teaches a liquid crystal display device comprising: a liquid crystal panel comprising a first substrate, a second substrate and a liquid crystal layer, said liquid crystal layer comprising liquid crystal having negative dielectric anisotropy provided between the first and second substrates (see [0120] and claims 1 & 5); and a drive voltage setting section which sets a drive voltage to drive the liquid crystal panel and supplies the set drive voltage to the liquid crystal panel, wherein: the drive voltage setting section sets a drive voltage in accordance with viewing angle characteristics of the liquid crystal panel, thereby controlling viewing angle characteristics, and switches between wide viewing angle characteristics and narrow viewing angle characteristics (see [0103] and [0174]).

Okumura does not directly teach wherein the drive voltage is such that the transmission intensity at oblique viewing angle is increased to strengthen excess brightness and grayscale inversion, achieving narrow viewing angle characteristics, and the transmission intensity at oblique viewing angle is decreased to weaken the excess brightness and grayscale inversion, achieving wide viewing angle characteristics.

AAPA teaches a drive voltage setting section sets a drive voltage in accordance with viewing angle characteristics of the liquid crystal panel, thereby controlling viewing angle characteristics, and switches between wide viewing angle characteristics and narrow viewing angle characteristics, wherein the drive voltage is such that the transmission intensity at oblique viewing angle is increased to strengthen excess brightness and grayscale inversion, achieving narrow viewing angle characteristics, and the transmission intensity at oblique viewing angle is decreased to weaken the excess brightness and grayscale inversion, achieving wide viewing angle characteristics (see [0004]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the drive voltage variations that increase or decrease grayscale inversion for achieving narrow or wide viewing angle characteristics taught by AAPA into the liquid crystal display device structure of Okumura in order to realize switching between wide and narrow viewing angle characteristics.

As to claim 14, Okumura teaches an electronic device (see [0004]) including a liquid crystal display device, the liquid crystal display device comprising: a liquid crystal

panel comprising a first substrate, a second substrate and a liquid crystal layer, said liquid crystal layer comprising liquid crystal having negative dielectric anisotropy provided between the first and second substrates (see [0120] and claims 1 & 5), a drive voltage setting section which sets a drive voltage to drive the liquid crystal panel and supplies the set drive voltage to the liquid crystal panel, wherein: the drive voltage setting section sets a drive voltage in accordance with viewing angle characteristics of the liquid crystal panel, thereby controlling viewing angle characteristics, and switches between wide viewing angle characteristics and narrow viewing angle characteristics (see [0103] and [0174]).

Okumura does not directly teach wherein the drive voltage is such that the transmission intensity at oblique viewing angle is increased to strengthen excess brightness and grayscale inversion, achieving narrow viewing angle characteristics, and the transmission intensity at oblique viewing angle is decreased to weaken the excess brightness and grayscale inversion, achieving wide viewing angle characteristics.

AAPA teaches a drive voltage setting section sets a drive voltage in accordance with viewing angle characteristics of the liquid crystal panel, thereby controlling viewing angle characteristics, and switches between wide viewing angle characteristics and narrow viewing angle characteristics, wherein the drive voltage is such that the transmission intensity at oblique viewing angle is increased to strengthen excess brightness and grayscale inversion, achieving narrow viewing angle characteristics, and the transmission intensity at oblique viewing angle is decreased to weaken the excess

brightness and grayscale inversion, achieving wide viewing angle characteristics (see [0004]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the drive voltage variations that increase or decrease grayscale inversion for achieving narrow or wide viewing angle characteristics taught by AAPA into the liquid crystal display device structure of Okumura in order to realize switching between wide and narrow viewing angle characteristics.

As to claim 15, Okumura teaches an electronic device capable of performing at least two types of functions among the following functions: electronic messaging, camera shooting, Internet access, and television reception (see [0004]), and including a liquid crystal display device displaying a state of performing the function during performance of each of the functions, the liquid crystal display device comprising: a liquid crystal panel comprising a first substrate, a second substrate and a liquid crystal layer, said liquid crystal layer comprising liquid crystal having negative dielectric anisotropy provided between the first and second substrates (see [0120] and claims 1 & 5); a drive voltage setting section which sets a drive voltage to drive the liquid crystal panel and supplies the set drive voltage to the liquid crystal panel, wherein: the drive voltage setting section sets a drive voltage corresponding to the function to be performed, thereby controlling viewing angle characteristics, and switches between wide viewing angle characteristics and narrow viewing angle characteristics (see [0103] and [0174]).

Okumura does not directly teach wherein the drive voltage is such that the transmission intensity at oblique viewing angle is increased to strengthen excess brightness and grayscale inversion, achieving narrow viewing angle characteristics, and the transmission intensity at oblique viewing angle is decreased to weaken the excess brightness and grayscale inversion, achieving wide viewing angle characteristics.

AAPA teaches a drive voltage setting section sets a drive voltage in accordance with viewing angle characteristics of the liquid crystal panel, thereby controlling viewing angle characteristics, and switches between wide viewing angle characteristics and narrow viewing angle characteristics, wherein the drive voltage is such that the transmission intensity at oblique viewing angle is increased to strengthen excess brightness and grayscale inversion, achieving narrow viewing angle characteristics, and the transmission intensity at oblique viewing angle is decreased to weaken the excess brightness and grayscale inversion, achieving wide viewing angle characteristics (see [0004]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the drive voltage variations that increase or decrease grayscale inversion for achieving narrow or wide viewing angle characteristics taught by AAPA into the liquid crystal display device structure of Okumura in order to realize switching between wide and narrow viewing angle characteristics.

As to claims 10-13, Okumura and AAPA teach the liquid crystal display device according to claim 1 (see above rejection). Okumura teaches a display mode of a liquid

crystal panel is VA (Vertically Aligned) mode, CPA (Continuous Pinwheel Alignment) mode, MVA (Multi-Domain Vertically Aligned) mode, and RTN (Reverse twisted nematic) mode (see figure 3A). Note that CPA, MVA, and RTN are obvious modes because it they are just types of vertically aligned modes.

As to claim 16, Okumura and AAPA teach the liquid crystal display device according to claim 15 (see above rejection). Okumura also teaches the drive voltage corresponding to the function to be performed is set in advance (see [0103] and [0174]). Note that it is obvious for these drive voltages to be set in advance because they are already defined as on and off.

As to claim 17, Okumura and AAPA teach the liquid crystal display device according to claim 15 (see above rejection). Okumura also teaches the drive voltage in accordance with a switching signal for switching between wide viewing angle characteristics and narrow viewing angle characteristics (see [0103] and [0174]). Note that it is obvious that since the voltages can be switched that a switching signal would be used for switching between angle characteristics.

As to claim 18, Okumura and AAPA teach the liquid crystal display device according to claim 15 (see above rejection). Okumura also teaches under a circumstance where the drive voltage is set to a drive voltage for wide viewing angle characteristics, sets a drive voltage which is to be applied to an arbitrary part of the

liquid crystal panel, so as to be a drive voltage for narrow viewing angle characteristics (see [0103] and [0174]). Note that it is obvious and well known in the art for a drive voltage to be applied to an arbitrary part of the liquid crystal panel.

As to claim 19, Okumura and AAPA teach the liquid crystal display device according to claim 15 (see above rejection). Okumura also teaches under a circumstance where the drive voltage is set to a drive voltage for narrow viewing angle characteristics, sets a drive voltage which is to be applied to an arbitrary part of the liquid crystal panel, so as to be a drive voltage for wide viewing angle characteristics (see [0103] and [0174]). Note that it is obvious and well known in the art for a drive voltage to be applied to an arbitrary part of the liquid crystal panel.

As to claims 20 and 21, Okumura and AAPA teach the liquid crystal display device according to claim 15 (see above rejection). Okumura also teaches the drive voltage setting section, in performing the Internet access and electronic messaging (see [0004]), sets the drive voltage corresponding to narrow viewing angle characteristics (see [0103] and [0174]). The teaching of Internet access or electronic messaging is obvious from paragraph [0004] of Okumura (LCD devices have been extensively used for electronic equipment designed for portable communication).

As to claim 22, Okumura and AAPA teach the liquid crystal display device according to claim 15 (see above rejection). Okumura also teaches the drive voltage

setting section, sets the drive voltage corresponding to wide viewing angle characteristics (see [0103] and [0174]). The teaching of camera shooting, Internet access or electronic messaging is obvious from paragraph [0004] of Okumura (LCD devices have been extensively used for electronic equipment designed for portable communication).

3. Claims 2-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiroshi Okumura (Pub. No.: US 2002/0191128) in view of AAPA, further in view of Donald E. Mosier (Patent No.: US 5,489,918).

As to claim 2, Okumura and AAPA teach the liquid crystal display device according to claim 1 (see above rejection).

Okumura and AAPA do not directly teach the drive voltage details in relation to the grayscale.

Mosier teaches a drive voltage for a lower end of grayscale to be supplied to the liquid crystal panel with narrow viewing angle characteristics so as to be higher than a drive voltage for a lower end of grayscale to be supplied to the liquid crystal panel with wide viewing angle characteristics (see column 12 lines 21-24 and column 25 lines 7-20).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of the grayscale drive relation taught by Mosier into the liquid crystal display device taught by Okumura and AAPA in order to provide a method and apparatus for generating gray level voltages which can

compensate for a variety of different factors associated with the performance of the LCD.

As to claim 3, Okumura and AAPA teach the liquid crystal display device according to claim 1 (see above rejection).

Okumura and AAPA do not directly teach a drive voltage for a higher end of grayscale to be supplied to the liquid crystal panel, so as to be a voltage on which grayscale degradation occurs at the oblique viewing angle.

Mosier teaches a drive voltage for a higher end of grayscale to be supplied to the liquid crystal panel, so as to be a voltage on which grayscale degradation occurs at the oblique viewing angle (see column 6 lines 66-67, column 7 lines 1-7, and column 25 lines 7-20, 44-60).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of the grayscale degradation taught by Mosier into the liquid crystal display device taught by Okumura and AAPA in order to provide a method and apparatus for generating gray level voltages which can compensate for a variety of different factors associated with the performance of the LCD.

As to claim 4, Okumura and AAPA teach the liquid crystal display device according to claim 1 (see above rejection).

Okumura and AAPA do not directly teach when transmission intensity of the liquid crystal panel has such a magnitude that grayscale inversions occur on a higher end of grayscale at the oblique viewing angle, sets a drive voltage for a higher end of grayscale to be supplied to the liquid crystal panel with wide viewing angle characteristics to be a voltage on which no grayscale degradation occurs at the oblique viewing angle.

Mosier teaches the drive voltage setting section, when transmission intensity of the liquid crystal panel has such a magnitude that grayscale inversions occur on a higher end of grayscale at the oblique viewing angle, sets a drive voltage for a higher end of grayscale to be supplied to the liquid crystal panel with wide viewing angle characteristics to be a voltage on which no grayscale degradation occurs at the oblique viewing angle (see column 6 lines 66-67, column 7 lines 1-7, column 25 lines 7-20, 44-60, 66-67 and column 26 lines 1-5, 17-21, 58-63).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of the grayscale drive relation taught by Mosier into the liquid crystal display device taught by Okumura and AAPA in order to provide a method and apparatus for generating gray level voltages which can compensate for a variety of different factors associated with the performance of the LCD.

As to claim 5, the combination of Okumura, AAPA and Mosier teach the liquid crystal display device according to claim 4 (see above rejection). Mosier also teaches

the drive voltage setting section does not change a drive voltage for a lower end of grayscale to be supplied to the liquid crystal panel (see column 26 lines 25-34).

As to claim 6, Okumura and AAPA teach the liquid crystal display device according to claim 1 (see above rejection).

Okumura and AAPA do not directly teach drive voltage with reference to a lookup table, set in advance, representing a relationship between an input grayscale level and a drive voltage.

Mosier teaches the drive voltage setting section sets a drive voltage with reference to a lookup table (in this case a graph/wave form), set in advance, representing a relationship between an input grayscale level and a drive voltage (see column 14 lines 16-29, 44-57, column 15 lines 16-19, 32-34, 39-41, 52-65, column 16 lines 37-45, and column 26 lines 37-54).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of drive voltage with reference to a graph, set in advance, representing a relationship between an input grayscale level and a drive voltage taught by Mosier into the liquid crystal display device taught by Okumura and AAPA in order to provide a method and apparatus for generating gray level voltages which can compensate for a variety of different factors associated with the performance of the LCD.

As to claim 7, the combination of Okumura, AAPA, and Mosier teach the liquid crystal display device according to claim 6 (see above rejection). Mosier also teaches the lookup table (wave form/graph) is set for each type of viewing angle characteristics, and the drive voltage setting section selects a lookup table corresponding to viewing angle characteristics (see column 7 lines 8-39 and column 14 lines 44-57).

As to claim 8, Okumura and AAPA teach the liquid crystal display device according to claim 1 (see above rejection).

Okumura and AAPA do not directly teach a drive voltage in accordance with a program, set in advance, representing a relationship between an input grayscale level and a drive voltage.

Mosier teaches a drive voltage in accordance with a program (set of instructions), set in advance, for determining an output grayscale level with respect to an input grayscale level (see column 14 lines 16-29, column 15 lines 10-15, 32-42, column 16 lines 37-45, column 17 lines 50-57, 66-67, and column 18 lines 1-8).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of a drive voltage in accordance with a program, set in advance, representing a relationship between an input grayscale level and a drive voltage taught by Mosier into the liquid crystal display device taught by Okumura and AAPA in order to provide a method and apparatus for generating gray level voltages which can compensate for a variety of different factors associated with the performance of the LCD.

As to claim 9, the combination of Okumura, AAPA, and Mosier teach the liquid crystal display device according to claim 8 (see above rejection). Mosier also teaches the program set for each type of viewing angle characteristic, and the drive voltage setting section selects and executes a program corresponding to viewing angle characteristics (see column 7 lines 35-40, column 18 lines 3-8, column 19 lines 66-67, and column 20 lines 1-19, 60-65).

Note: References cited include just some examples that Examiner feels best explain the prior art rejection. However, the entire references teach the scope of the claims in more detail. Examiner recommends that Applicant read the full disclosures.

Response to Arguments

4. Applicant's arguments with respect to claims 1-22 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Patent No.: US 5,969,700 and US 7,400,367 and Publication No.: US 2003/0146893.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JENNIFER ZUBAJLO whose telephone number is

(571)270-1551. The examiner can normally be reached on Monday-Friday, 8 am - 5 pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amare Mengistu can be reached on (571) 272-7674. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jennifer Zubajlo/
3/19/09
Examiner, Art Unit 2629

/Amare Mengistu/

Supervisory Patent Examiner, Art Unit 2629